

Lesson 6 - 5.6 Connecting Standard and Vertex Forms Answers.notebook November 24, 2015

(5.6) Connecting Standard and Vertex Forms

$y = ax^2 + bx + c$ $y = a(x-h)^2 + k$

1) $y = (x-3)^2 + 10$ Vertex: $(3, 19)$ $a = 1$
 $y = (x-3)(x-3) + 10$
 $y = x^2 - 6x + 9 + 10$
 $y = x^2 - 6x + 19$
 $a = 1$
 $b = -6$ ****look for patterns****

2) $y = 2(x+4)^2 - 5$ Vertex: $(-4, -5)$
 $y = 2(x+4)(x+4) - 5$
 $y = 2(x^2 + 8x + 16) - 5$
 $y = 2x^2 + 16x + 32 - 5$
 $y = 2x^2 + 16x + 27$
 $a = 2$
 $b = 16$

3) $y = 3(x-1)^2 + 12$ Vertex: $(1, 12)$
 $y = 3(x-1)(x-1) + 12$
 $y = 3(x^2 - 2x + 1) + 12$
 $y = 3x^2 - 6x + 3 + 12$
 $y = 3x^2 - 6x + 15$
 $a = 3$
 $b = -6$

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(5.6) Connecting Standard and Vertex Forms

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1) $y = (x-3)^2 + 10$ Vertex: $(3, 10)$
 $y = (x-3)(x-3) + 10$
 $y = x^2 - 6x + 9 + 10$
 $y = x^2 - 6x + 19$
 $a = 1$
 $b = -6$ ****look for patterns****

2) $y = 2(x+4)^2 - 5$ Vertex: $(-4, -5)$
 $y = 2(x+4)(x+4) - 5$
 $y = 2(x^2 + 8x + 16) - 5$
 $y = 2x^2 + 16x + 32 - 5$
 $y = 2x^2 + 16x + 27$
 $a = 2$
 $b = 16$ $-\frac{b}{2a} = \frac{-16}{2(2)} = -4$
 $k = c - \frac{b^2}{4a} = 27 - \frac{256}{8} = -5$

3) $y = 3(x-1)^2 + 12$ Vertex: $(1, 12)$
 $y = 3(x-1)(x-1) + 12$
 $y = 3(x^2 - 2x + 1) + 12$
 $y = 3x^2 - 6x + 3 + 12$
 $y = 3x^2 - 6x + 15$
 $a = 3$
 $b = -6$ $-\frac{b}{2a} = \frac{-(-6)}{2(3)} = 1$
 $k = c - \frac{b^2}{4a} = 15 - \frac{36}{12} = 12$

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To find the x-coordinate of the vertex from standard form:

$x = \frac{-b}{2a}$

Find the vertex of:

a) $y = x^2 + 6x + 8$ $x_v = \frac{-b}{2a} = \frac{-6}{2(1)} = -3$
 $y_v = (-3)^2 + 6(-3) + 8 = 9 - 18 + 8 = -1$
 Vertex: $(-3, -1)$

b) $y = 2x^2 + 8x - 11$ $x_v = \frac{-b}{2a} = \frac{-8}{2(2)} = -2$
 $y_v = 2(-2)^2 + 8(-2) - 11 = 8 - 16 - 11 = -19$
 Vertex: $(-2, -19)$

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Second Technique Partial Factor To find the x-coordinate of the vertex from standard form:

Find the vertex of:

$y = 2x^2 + 8x - 11$

Factor first: $y = 2x(x+4) - 11$ New way: $y = 2(x+2)^2 - 11$
 $y = 2(x+2)(x+2) - 11$
 $y = 2(x^2 + 4x + 4) - 11$
 $y = 2x^2 + 8x + 8 - 11$
 $y = 2x^2 + 8x - 3$
 $x_v = -2$
 $y_v = 2(-2)^2 + 8(-2) - 11 = 8 - 16 - 11 = -19$
 Vertex: $(-2, -19)$

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 $y_v = 2(-2)^2 + 8(-2) - 11 = 8 - 16 - 11 = -19$
 Vertex: $(-2, -19)$

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Review Ques
Word Problems
p. 294 q. 11 & 13

Apr 29-9:04 AM

Homework
p.301 and 302

q.2,3,5 a,c,f, 7 a,c,e & 11

Apr 29-9:06 AM